FIG. 1

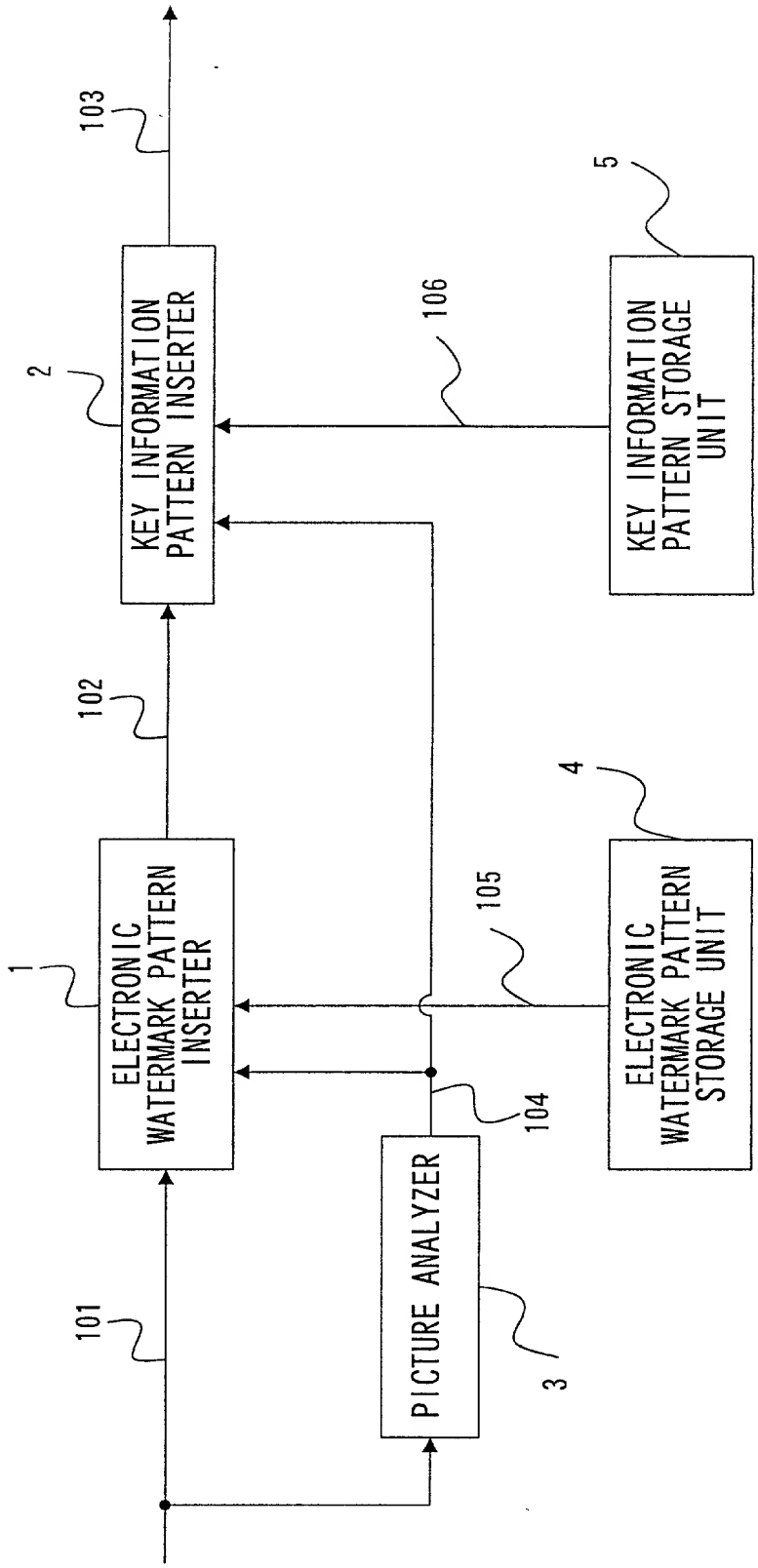
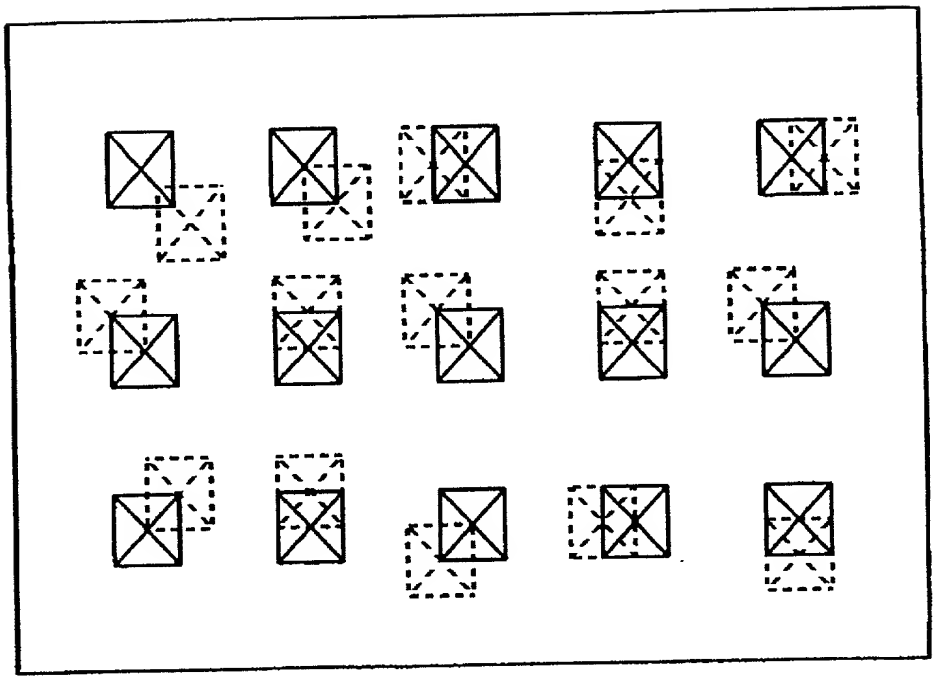

ELECTRONIC WATERMARK PATTERN INSERTER
1
KEY INFORMATION PATTERN INSERTER
2
PICTURE ANALYZER
3
ELECTRONIC WATERMARK PATTERN STORAGE UNIT
4
KEY INFORMATION PATTERN STORAGE UNIT
5
101
102
103
104
105
106

FIG . 2



CENTER POSITION OF INSERTION OF KEY INFORMATION

ACTUAL POSITION OF INSERTION OF KEY INFORMATION

Translated: 2/7/2005

FIG. 3

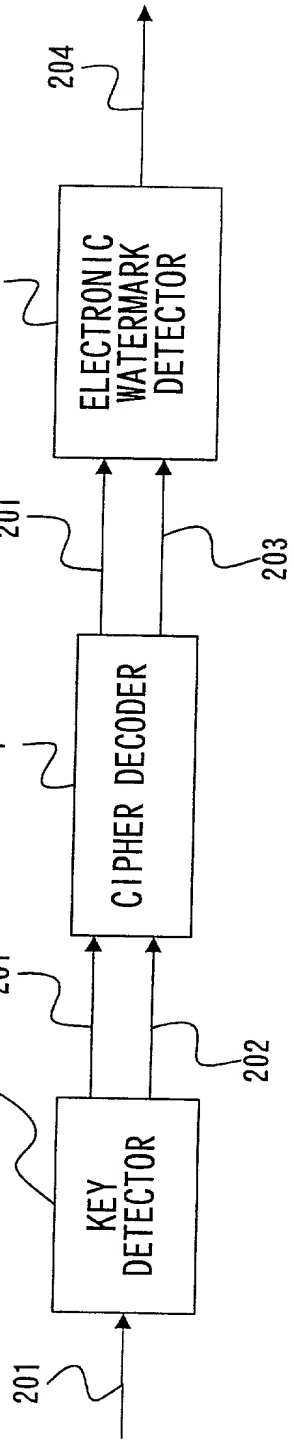

201
6
KEY DETECTOR
201
202
7
CIPHER DECODER
201
203
8
ELECTRONIC WATERMARK DETECTOR
204

FIG. 4

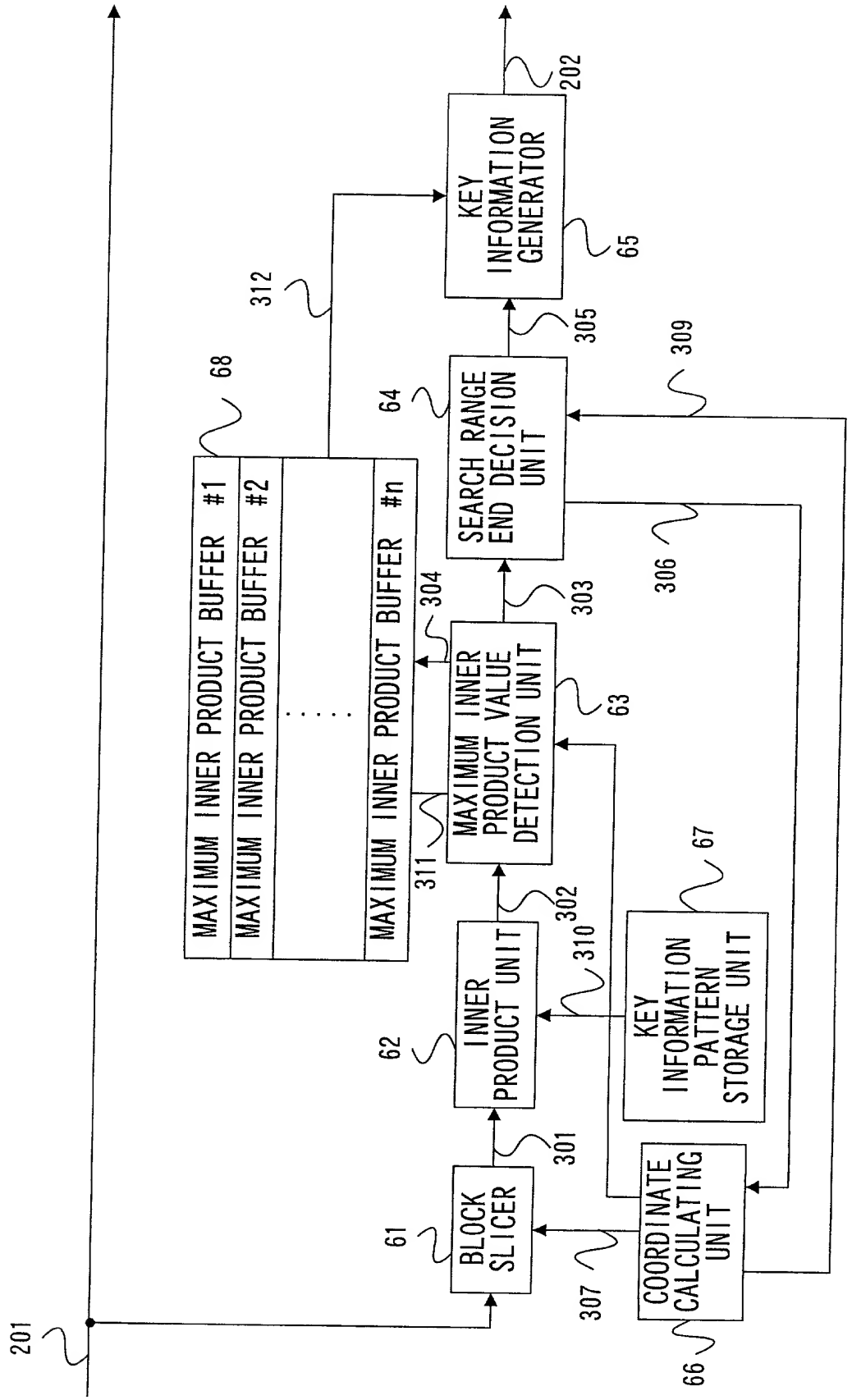

201
61
BLOCK SLICER
307
66
COORDINATE CALCULATING UNIT
301
62
INNER PRODUCT UNIT
310
302
KEY INFORMATION PATTERN STORAGE UNIT
67
311
MAXIMUM INNER PRODUCT VALUE DETECTION UNIT
63
304
303
306
64
SEARCH RANGE END DECISION UNIT
309
305
312
68
MAXIMUM INNER PRODUCT BUFFER #1
MAXIMUM INNER PRODUCT BUFFER #2
MAXIMUM INNER PRODUCT BUFFER #n
65
KEY INFORMATION GENERATOR
202

FIG . 5

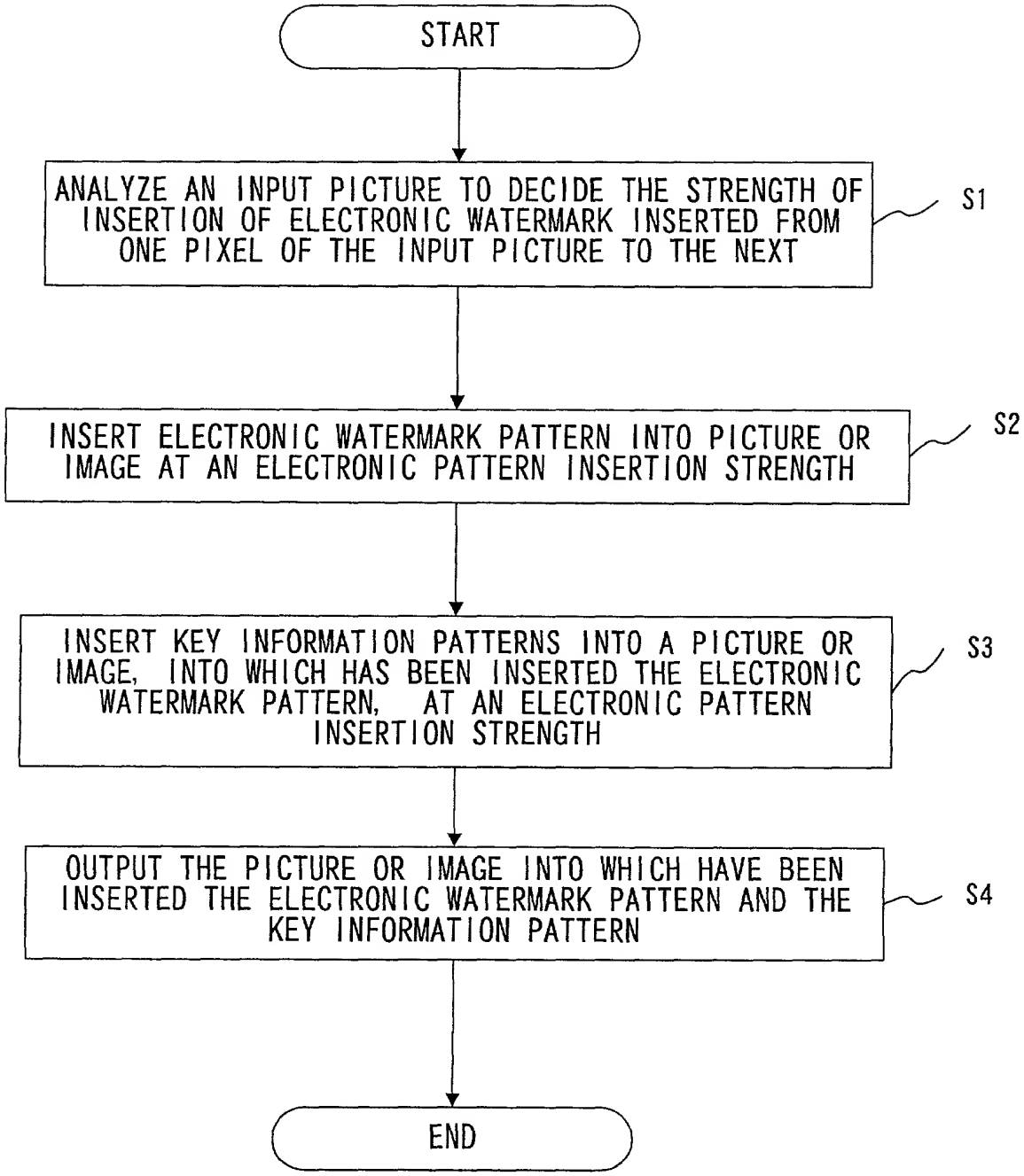

START
ANALYZE AN INPUT PICTURE TO DECIDE THE STRENGTH OF INSERTION OF ELECTRONIC WATERMARK INSERTED FROM ONE PIXEL OF THE INPUT PICTURE TO THE NEXT
S1
INSERT ELECTRONIC WATERMARK PATTERN INTO PICTURE OR IMAGE AT AN ELECTRONIC PATTERN INSERTION STRENGTH
S2
INSERT KEY INFORMATION PATTERNS INTO A PICTURE OR IMAGE, INTO WHICH HAS BEEN INSERTED THE ELECTRONIC WATERMARK PATTERN, AT AN ELECTRONIC PATTERN INSERTION STRENGTH
S3
OUTPUT THE PICTURE OR IMAGE INTO WHICH HAVE BEEN INSERTED THE ELECTRONIC WATERMARK PATTERN AND THE KEY INFORMATION PATTERN
S4
END

FIG . 6

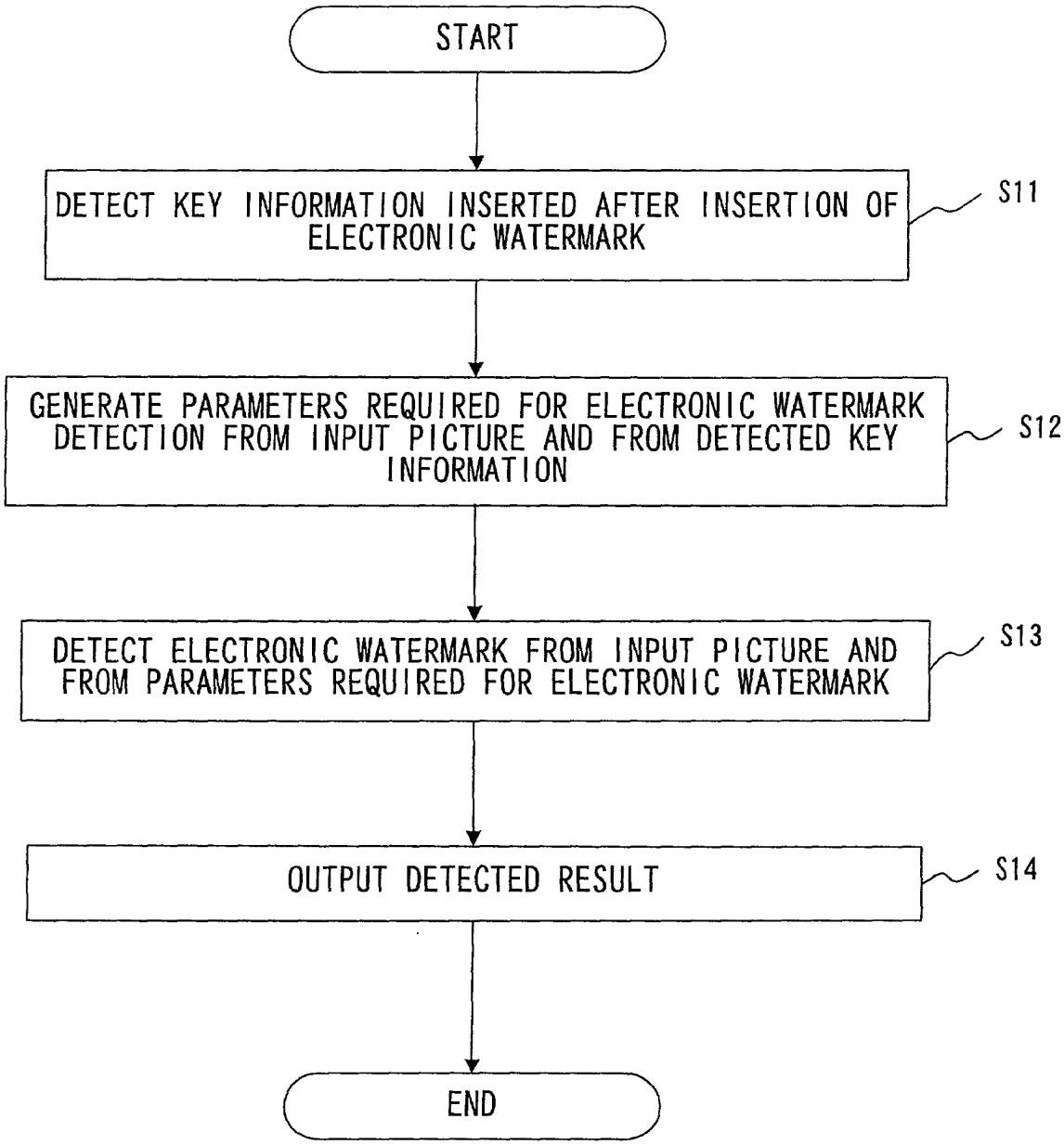
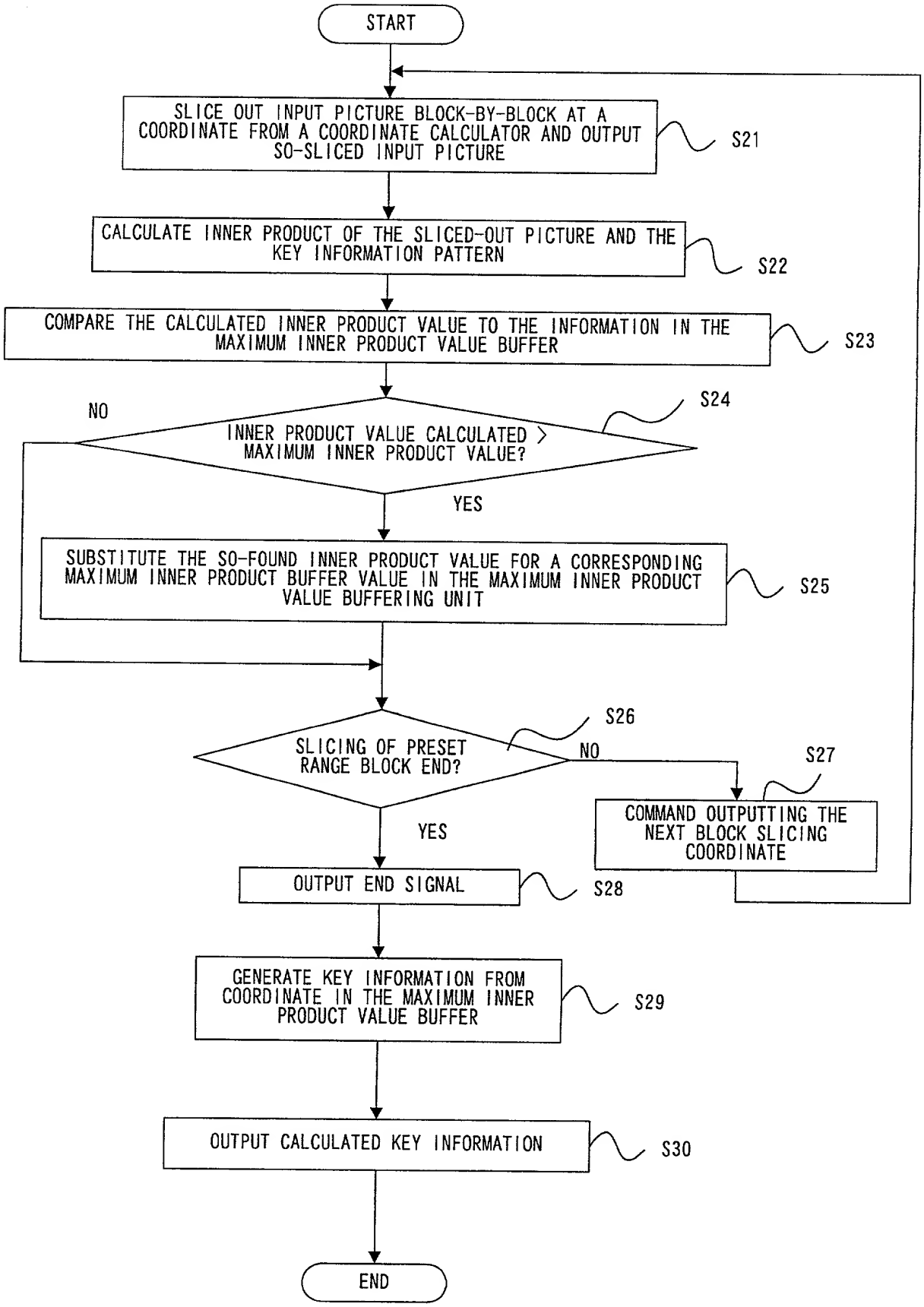

START
DETECT KEY INFORMATION INSERTED AFTER INSERTION OF ELECTRONIC WATERMARK
S11
GENERATE PARAMETERS REQUIRED FOR ELECTRONIC WATERMARK DETECTION FROM INPUT PICTURE AND FROM DETECTED KEY INFORMATION
S12
DETECT ELECTRONIC WATERMARK FROM INPUT PICTURE AND FROM PARAMETERS REQUIRED FOR ELECTRONIC WATERMARK
S13
OUTPUT DETECTED RESULT
S14
END

FIG . 7


START
SLICE OUT INPUT PICTURE BLOCK-BY-BLOCK AT A COORDINATE FROM A COORDINATE CALCULATOR AND OUTPUT SO-SLICED INPUT PICTURE
S21
CALCULATE INNER PRODUCT OF THE SLICED-OUT PICTURE AND THE KEY INFORMATION PATTERN
S22
COMPARE THE CALCULATED INNER PRODUCT VALUE TO THE INFORMATION IN THE MAXIMUM INNER PRODUCT VALUE BUFFER
S23
S24
NO
INNER PRODUCT VALUE CALCULATED > MAXIMUM INNER PRODUCT VALUE?
YES
SUBSTITUTE THE SO-FOUND INNER PRODUCT VALUE FOR A CORRESPONDING MAXIMUM INNER PRODUCT BUFFER VALUE IN THE MAXIMUM INNER PRODUCT VALUE BUFFERING UNIT
S25
S26
SLICING OF PRESET RANGE BLOCK END?
NO
S27
COMMAND OUTPUTTING THE NEXT BLOCK SLICING COORDINATE
YES
OUTPUT END SIGNAL
S28
GENERATE KEY INFORMATION FROM COORDINATE IN THE MAXIMUM INNER PRODUCT VALUE BUFFER
S29
OUTPUT CALCULATED KEY INFORMATION
S30
END